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SUSTAINING THE FORCES: THE COMBAT LOGISTICS
PROBLEM IN THE 1990s AND BEYOND

By:

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A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Operations.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

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Abstract of
SUSTAINING THE FORCES: THE COMBAT LOGISTICS
PROBLEM IN THE 1990s AND BEYOND

The Navy's Combat Logistics Force will be hard pressed to ensure sustainability of forward deployed forces given the reduced CLF shipbuilding schedule and the dispersal of battle groups in a theatre. The current practice of tying the CLF ships to the battle group is questioned. Alternative methods of utilizing logistic ship assets are explored including regional CLF groups, using the CLF to support Army and Air Force deployed forces, and substituting merchant ships for CLF ships. The study concludes that using merchant ships to augment the CLF is cheaper than expanding the CLF but that operational deficiencies arise that may hazard the timely replenishment of the deployed battle group. Nevertheless, in today's austere fiscal environment, any program that can save millions of dollars should be thoroughly investigated.

INTRODUCTION

The U.S. Navy's maritime strategy must do some evolving as "old threats" (Soviet Union, Warsaw Pact) are metamorphosing and "new threats" (drug exporters, regional strongmen) come forth into the limelight. The threat of a NATO vs. Warsaw Pact war at sea is defunct; the Soviet Union is still a threat, but now we may face their aircraft capable ships in seas distant from their homeland. Drug interdiction is an announced national priority and the Department of Defense is being called on to supplement Coast Guard and Federal law enforcement forces. But no matter how much the basic tenets of our maritime strategy change one principle cannot not be discounted or overlooked: sustainability of forces is a vital parameter in the decision of what forces can be used where, when can they be used, and how many can be used. Sustainability is effected by one or a combination of three sources: 1) we can resupply our own forces; 2) our allies can resupply our forces; or 3) our forces can live off the conquered land. The wise operational level commander will ensure that the first option is planned for. In this paper I will investigate the problem that the Navy faces in providing for sustainability of deployed forces.

THE UNDERWAY REPLENISHMENT CONCEPT

Naval forces have a distinct advantage over land forces or land-based aircraft. They can be deployed anywhere in the world, remain in international waters until the decisive time, then exert their power either by power projection ashore or sea control. Their success, of course, depends upon their being able to destroy more of the enemy than being destroyed by the enemy, or by neutralizing the enemy's anti-ship capability without having to fire a shot.

Logistic support of our Naval forces is a critical element in their being able to accomplish their mission. U.S. Navy ships have about a 45 day supply of food onboard. But food is perhaps one of the least critical requirements for sustained operations. Most of the ships burn fossil fuel, some more efficiently than others, but, nevertheless, a ship Commanding Officer and the Task Group Commander know exactly how much fuel each ship has on a daily basis. The Theatre Commander, through his staff logistics element, is also briefed on the task group's fuel state. In addition to fuel and food, spare parts, ammunition, and often technical experts, are needed to keep a task group ready to carry out whatever mission may be assigned.

To provide this logistic support, a system is in place to ensure that each ship is kept at a high state of material

readiness no matter how distant it may be from a shore depot. The original concept called for a three-tiered system starting from the United States and ending on board the individual ship (end user). First, merchant ships, generally breakbulk cargo carriers, transport material and ammunition from U.S. ports to forward bases, such as Subic Bay, Philippines, Guam, Yokosuka, Japan, and Diego Garcia in the Indian Ocean. Petroleum, oil and lubrication (POL) is transported by tankers to POL storage depots, usually co-located with the forward bases.

In the next tier, fuel and supplies are transported from the forward bases by U.S Navy or Maritime Sealift Command shuttle ships. These are single product oriented ships which are from 14,000 to 20,000 tons displacement. The ships are not designed to catch up to and remain with high speed combatants but rather to intercept them along their intended track or rendezvous with them in their area of operations.

There are three types of ships that can be labeled shuttle ships: 1) ammunition ships; 2) oilers; and 3) stores ships, which carry food, spare parts, dry stores and fleet freight. All three types of ships have limited capability to expand what they can deliver to the group. For example, ammunition ships can carry up to 500 tons of fleet freights, 5 tons of food, and as many spare parts that can be fit in its many storerooms.

This expansion of support that a formerly single product ship could offer is called the "mini-multi" concept. It involves placing refrigerated vans and large storage boxes in available deck space on the ships for further transfer to end-user ships. The "mini-multi" concept was necessitated because of a lack in the third tier of the fleet replenishment system--the station ship.

The original fleet logistics plan called for the shuttle ships to rendezvous with large (50,000 ton) U.S. Navy fast combat support ships (AOE). These ships can keep up with the high speed surface combatants and replenish them with POL, ammunition, stores, and spare parts. Only four of these ships were built, however, and the need for logistic support of carrier battle groups exceeded the available AOE's. Recognizing this need, the Navy built replenishment oilers (AOR) which, when coupled with an ammunition ship, can provide the same level of support as an AOE. While the AOR can keep up with the carrier battle group (CVBG), it often takes innovative logistic planning to utilize the slower ammunition ship.

To supplement the U.S. Navy's organic Combat Logistics Force, the Military Sealift Command (MSC) maintains 90 ships in the ready reserve force (RRF). Each RRF ship will be crewed by a particular shipping firm when they are activated. Periodically ships are broken out of their laid up status and

participate in exercises or special missions to test MSC's ability to activate them on five day's notice. Of these RRF ships, six dry cargo ships and two oilers are fitted with equipment capable of transferring cargo or POL to Navy ships underway. The first time these ships were used in the role of underway replenishers was during an exercise in the Mediterranean in 1985 when the SS Southern Cross performed as the refrigerated stores ship for the exercise. During Desert Shield/Storm the RRF ships, Cape Archway and Cape Ann, were used as ammunition supply ships. Seven other RRF ships were readied to be used in the underway replenishment role as well.

The fact that the RRF ships successfully performed underway replenishment opens up new options for the Theatre Commander. The use of the RRF for Desert Shield/Storm provided valuable lessons learned on the ability of the United States to activate and use its reserve fleet. The specific lessons learned are beyond the scope of this paper. It will be assumed that the experience gained in 1990/91 will cause MSC and the Maritime Administration to make changes in their procedures so that the next mobilization of reserve ships will be even smoother. The Theatre Commander will have these assets not only to provide strategic sealift to the area of need, but also to draw upon the properly equipped ships to supplement the CLF assets. This is vital when one considers that the CLF force is stretched very thin today to adequately provide second and

third "reloads" to a deployed battle group. By stretched thin it is meant that the ability of CLF ships to keep up with a high speed battle group will not increase as much as was planned for a few years ago.

The first of the new class of fast combat support ships, the gas turbine powered USS Supply (AOE-6), is already two years behind schedule. The original goal was for a total force of twelve supply class AOE's, which would allow each CVBG to be supported by an AOE. As of this writing, however, it is doubtful that the Navy will be authorized to build all twelve, and may have to settle for as few as four. The "jumboizing" of the five ships of the Cimarron class, the first of which is only eight years old, will help offset the reduced number of AOE's, but the Cimarron class ships cannot keep up with a battle group transiting at a speed greater than 20 knots.

The remainder of the Navy's CLF fleet is aging. Ammunition ships have been under increased demand as the Iran, Afghanistan, and Kuwait crises affected the Theatre Commander's distribution of assets. Two of the elderly Nitro class AEs, which had been transferred to the reserve fleet, were returned to active service in 1982. The five ships of the Nitro and Suribachi class are beyond thirty years of service, however, and are scheduled for deactivation in the mid-1990's. A new class of AE is included in the Navy's long range building

plans, and the first was to have been appropriated for in 1986, but it has been delayed, perhaps indefinitely. The use of the RRF for underway ammunition replenishment will probably become an operational necessity if future conflicts require multiple battle groups scattered throughout a theatre.

THE CHANGING ROLE OF NAVAL BATTLE GROUPS

"Although the carrier battle group will remain predominant in our overseas deployment pattern, the introduction of VLS-equipped ships like the AEGIS cruiser will give us the capability to deploy our battle groups differently than we do today." ¹

The lower limit on the number of ships the Navy will have in the decades ahead is not a universally agreed upon number. The 600 ship Navy vision of the early 1980's has been replaced by hopes for a 450-500 ship Navy. The conventionally powered aircraft carriers will be decommissioned by the year 2000 and the plans for 15 nuclear powered aircraft carriers have been scrapped. The big issue is, then, will our Naval commitment throughout the world decrease proportionally with the downsizing of our deployable ships? The Navy will probably have to do what it always has been asked to do--to do as much, or more, with less. The fact that the relatively rapid deterioration of the old communist bloc did not mean that "peace would break out all over" leads us to expect a continuing need for deployable forces. When forces deploy, in whatever form they take, they need logistical support.

In his remarks at the Change of Command for Commander Naval Surface, Pacific, in December 1990, Vice Admiral Larson alluded to the possibility of battle groups that would train

¹ Vice Admiral Larson, CINCPACFLT, 15 December 1990.

together, but soon after deploying would disperse throughout the region. What then becomes of the Combat Logistics Force ships? Traditionally these ships are tied to the battle group and replenishes them regularly. If the ships of the battle group are dispersed to different regions, the replenishment problem becomes enormous. For example, if the aircraft carrier and a few escorts are maintaining a presence in the South China Sea and a Surface Action Group, consisting of an AGEIS cruiser and a few destroyers, is in the Sea of Japan, with whom does the AOE or AOR/AE/AO ships remain? A quick guess might be that the CLF ships steam with the conventionally powered ships since they are the ones that need POL for their main engines. The aircraft carrier, however, has a need for aviation fuel to keep its main battery, its embarked air wing, trained and ready for use. A second guess might be that the Military Sealift Command ships which are forward deployed in Sasebo, Japan, Subic Bay, Philippines, and Guam, can replenish the battle group ships in their area. It would be unwise to have to rely on our being able to keep ships forward deployed. The bases in the Philippines are certainly not considered a "sure thing" today as they were ten years ago.

One possible solution to the problem of logistical support for a widely dispersed battle group would be to "liberate" the Combat Logistics Force from the battle groups. The surface combatants would deploy as usual and, when dispersed throughout

a region, would call upon the "area CLF" asset for replenishment. These area CLF assets would deploy as a separate asset and remain within a specific region. A typical CLF group might be made up of a fast combat support ship, ammunition ship, stores ship, and a few surface combat escorts, such as one DD/DDG and two FFGs. The CLF group would stay within their assigned theatres, such as the Indian Ocean, Western Pacific, or Eastern/Northern Pacific. The dispersed surface battle group would use the CLF asset that was assigned to its specific area. The employment of the "mini-multi" concept would even allow the individual ships of the CLF group to disperse within their theatre. For example, an AE-26 class ammunition ship carrying 750,000 gallons of fuel and 4,000 tons of ammunition could, when fitted with refrigerated vans, easily replenish three or four destroyers. The fuel of choice would be JP-5, which can be used by gas turbine powered ships, steam powered ships, and the embarked helicopter detachments.

The biggest drawback to the area CLF concept is in its defense. An enemy could concentrate its offensive against the CLF group and with one coordinated anti-ship missile and/or torpedo attack wipe out the entire logistic assets of a theatre. Examination of potential enemies, however, provides a counter argument. Only the Soviet Union has the capability of amassing a force of sufficient size to successfully attack U.S. surface ships in open ocean. The CLF group would not steam

within range of land launched ASCMs or coastal patrol boats. Assuming that the United States would have sufficient warning of imminent war with the Soviet Union, the CLF group could steam to the vicinity of a protective Surface Action Group or carrier battle group. In a war with the Soviet Union, the traditional CVBG concept appears to be the best assurance of survival of the CLF group. The idea of an autonomous CLF group leads to a related concept, however, that of a "purple" CLF group.

THE PURPLE COMBAT LOGISTICS FORCE

At present, the Combat Logistics Force is tied to supporting U.S. Navy assets. There is no provision to supply, maintain or repair Army or Air Force equipment. Future contingencies will undoubtedly involve all services to some degree and for each service to have to plan for its own logistics may be inefficient. If the United States was called upon to send a force to South Africa or South America, similar to the force sent to Southwest Asia for Desert Shield/Storm, each service would operate independently in setting up its logistics trail. The United States Transportation Command, along with Military Sealift Command, would provide the Army and Air Force material while the Navy would send CVBGs supported by CLF ships. Unlike Desert Shield/Storm, there may not be a friendly country in which to stage the the supplies needed to support the forces ashore.

The Combat Logistics Force is in a position to provide support for all services. A destroyer tender has a vast amount of capability to repair shipboard equipment. It may not be feasible to convert a tender to also be able to repair Army equipment. The tender could steam off the coast, or berth inport, and become the rear area maintenance facility for Army equipment. Fuel for Army and Air Force equipment can be carried by CLF ships, obviating the need for activating RRF

tankers or hiring commercial tankers. In efforts of the magnitude of Desert Shield/Storm, the CLF could not provide all the Army and Air Force requires, but certainly in contingency operations, such as Granada or Panama, it can.

Using the CLF to provide support for all services could lead to it being placed under the control of TRANSCOM. The initial Navy reaction may be one of staunch opposition, but the concept does have some logic and precedent. Part of the Navy's mission is strategic sealift. However, this has been controlled by MSC and TRANSCOM during Desert Shield/Storm. While the Navy does obligate money for MSC, the ships are, in reality, civilian manned and are administered under civilian rules (maritime labor union rules). The fact that a Navy Vice Admiral is the Commander, MSC, does not mean the MSC ships are "Navy-run."

Placing the CLF under TRANSCOM or MSC has some complications. The Navy would be a competitor for use of CLF assets. In wartime this competition could be resolved by the Operational Commander who would state his requirements and the CLF would respond. In peacetime the competition would be more complicated. The Navy would have to state in advance of battle group deployments its CLF requirements and the CLF commander would weigh these against Army requirements. Admittedly, the Navy's requirements, which are more easily stated as the

necessity for fuel and supplies for a battle group, do not fall into a "nice to have" category but rather are hard requirements.

The most basic questions concerning the removal of the CLF from purely Navy control are "What's the problem?" and "What's broken?" Desert Shield/Storm showed that one half million ground troops could be fully supported without resorting to using the Navy's CLF. The difficulties of finding steam propulsion experienced crews for reactivating the logistic ships of the RRF have been published.² It must be noted that one of the lessons of Desert Shield/Storm was that chartering sealift was cheaper than reactivating the RRF.³ In searching for the best way to provide logistic support for the armed forces, the next logical step is to investigate the substitution of merchant vessels for Navy logistic ships.

² NAVY TIMES, Sept. 24, 1990, p. 30.

³ Admiral Frank Kelso, CNO, 26 April 1991, Naval War College.

SUBSTITUTING MERCHANT SHIPS FOR NAVAL LOGISTIC SHIPS

When one compares a Navy logistic ship with a civilian ship of comparable size, certain significant differences are apparent. First, the mission of the Navy ship is to replenish other military units while being exposed to hostile fire. To accomplish this mission, the Navy ships are equipped to transfer their cargo while underway. Second, the Navy ships are much more heavily manned than civilian ships. The redundancy among crew skills and equipment is important for mission accomplishment and damage control. Additionally, Navy ships are generally faster and carry self defense equipment which necessitates ammunition magazines and compartmentalization. The question then is not can merchant ships fully substitute for Navy ships, but can they provide the Navy with an acceptable degree of support? Further, if modification is needed to the merchant ships, can it be kept to a minimum level to meet that acceptability?

The need for exploring the use of merchant vessels for Navy logistics is easily justified. The U.S. Navy logistic strategy relies on forward basing of supplies which are then shuttled to the battle group by the Combat Logistics Force ships. The loss of these advance bases in Japan, Diego Garcia, and the Philippines in the Pacific and Indian Oceans, and bases

in Italy, Greece, Turkey and Spain in the Mediterranean, would cause a major problem in sustaining deployed battle groups. These bases may be lost through direct enemy action, blockade of the SLOCs leading to these bases, or political pressure on the part of the host country to reduce the amount of foreign presence on its sovereign soil. The consequences of losing advance bases are that the distances involved from the Indian Ocean to the closest U.S. controlled territory, Guam, is approximately 5000 miles. In the Atlantic, the nearest U.S. controlled territory to the Mediterranean is the east coast of the United States, 3300 NM from Spain, 5100 NM from the eastern Mediterranean op-area.

The Navy does not have enough ships in the CLF to maintain continuous logistics support over those distances. A battle group travelling a high speed needs POL replenishment every three to four days. Even if the battle group remains in a small area, the aircraft carrier needs to steam at 20+ knots to generate enough relative wind for launch and recovery of aircraft. Conventionally powered escorts need to keep up with the aircraft carrier, and fuel consumption curves show a marked decrease in fuel economy for every knot of speed over 18 knots. A battle group expending ordnance also needs regular replenishment. The Navy would have to have some replenishment ships en route the CVBG, some on station with them conducting the replenishment, and some returning for restocking. In this

situation, redundancy in logistic capability would be reduced, perhaps to the point where if a CVBG missed just one replenishment period, it would be significantly, perhaps catastrophically, out of action. If the Navy had a cadre of merchant ships that could augment the CLF ships, the problem of replenishment of the CVBG would certainly be diminished.

An existing merchant ship can be modified for Navy service as its need becomes imminent. The Navy purchases and stores the necessary equipment then installs it on merchant ships as the ships are needed. The Navy crew trained to operate the equipment would embark the merchant ship at the same time of the equipment. Merchant ships could also be used to provide services to the Navy during peacetime. The equipment can be installed on the merchant ships and a Navy communications team embarked. The underway replenishment equipment can be operated by the merchant crew or a Navy team can be embarked.

The equipment that needs to be added to merchant ships to allow them to conduct underway replenishment is a device known as a sliding padeye. It is a worm-screw device to raise and lower a cargo hook which then rides on a wire connecting the providing ship with the receiving ship. Communications equipment would also be added to allow for secure communications between the merchant and the Navy.

Modification of some merchant ships has already been done in an experimental program known as the "Charger Log" program. Merchant oilers have been fitted with refueling hoses and rigs. These low maintenance equipments are bolted on to the merchant ships and remain with the ship at all times. When directed, the merchant sails in the vicinity of a battle group. The CLF ship in company with the battle group goes alongside the merchant, sends U.S. Navy personnel to man the rig, connects the refueling hoses, and the fuel is pumped from the merchant to the Navy ship. In the Charger Log program, the communications are done by non-secure means using civilian radio frequencies. The program has been in place mainly in the Atlantic Fleet and is still being evaluated. The one major drawback is the lack of secure communications and the fact that only refueling replenishments have been conducted.

Modifying merchant ships for cargo underway transfer is simpler than for POL transfer. CLF ships routinely replenish and rearm surface combatants which do not have sliding padeyes or cargo winches. A secure padeye on a kingpost or exterior bulkhead of the merchant is all that a CLF ship needs to send and receive material.

An opportunity cost is associated with using merchant ships to satisfy the Navy's replenishment requirements. A merchant ship dedicated to the Navy would be unavailable for

use in other roles, such as strategic sealift for U.S. or NATO forces ashore or for importing strategic material into the U.S. for the defense industry. If the Navy kept the modified merchant ships as an "ace in the hole" and only used them for wartime then their loss to other uses would be felt when they would be most needed. If, on the other hand, the Navy signs long-term charter contracts for tankers to be used in peacetime, the extra demand may result in an expansion in commercial shipbuilding with the added benefit of creating jobs and revitalizing the sagging U.S. merchant fleet.

The total cost of modifying and using merchant ships to augment the CLF is difficult to quantify because commercial profits depend on supply and demand. If the Navy had to drastically cut shipbuilding and still meet all of its commitments, however, chartering, modifying and operating a tanker would cost approximately \$146 million in 30 year costs compared to \$195 million of procuring and operating a new AO-177 Navy oiler.⁴

Underway replenishment of ordnance is more difficult than either refueling or stores replenishment. The safety

⁴ Center for Naval Analysis, Substituting Merchant Ships for Naval Vessels: Support Missions. (Alexandria, VA, 1979) pp. 54-55.

requirements and degree of training exceed those of "safe cargo" handling requirements. The shipboard storage and damage control requirements would require more investment in initial modification of merchant ships than would for POL equipment modification. The Center for Naval Analysis analyzed using container ships for ordnance carriers and concluded that after minimum modification the 30 year saving would only be \$67 million. Additionally, the underway transfer rate would be approximately one-half that of a Navy ammunition ship to Navy combatant.⁵

The major concern in relying on merchant ships for military use is their availability. In planning for merchant augmentation, the question of standardization of equipment must be raised. There is no certainty that a given merchant ship's location can be controlled during peacetime. As hostilities grow imminent, the need for merchant augmentation grows. The necessity to outfit the merchants with replenishment equipment, or to test the pre-installed equipment, and to augment the communications suite will require the recall of designated merchants to shipyards. There is no guarantee that enough shipyards will be available. The Navy estimates that installing the equipment would take 30-90 days (assuming no

⁵ Ibid., p. 57.

delay in getting space at the shipyard, i.e., no queues).⁶ In a crisis, this time could mean delay in deploying battle groups and therefore a delay in establishing sea control, with the ultimate effect of hindering the National Command Authority in considering military options to crises. Another factor in availability of merchant ships is that not all merchants lend themselves to modification. Container ships have numerous problems which virtually removes them from consideration:

CONTAINER LIMITATIONS⁷

- o Some missiles are too large to fit into standard containers.
- o Combatant load lists may not call for full containers. This creates a significant weight/loading stability problem.
- o There are no provisions to move cargo from the holos to the main deck.
- o Navy ships are not configured to receive containers or to move them around on deck.
- o Empty containers would take up valuable space on a Navy ship.

⁶ Ibid., p. 59.

⁷ Ibid., excerpts from Table 1, p. 5.

There is the problem of non-standardization of merchant ships. Hatch dimensions, kingpost weight capability, and available deckspace may require different equipment "packages" for different merchant ship classes. If the available merchant is not configured to receive the available package, the Navy does not get the ship.

One area that seems to avoid many of the compatibility problems between merchant ships and Navy ships is in vertical replenishment (VERTREP). VERTREP, using Navy helicopters, is practiced by all Navy ships and is the preferred method when speed or environmental requirements precluded connected replenishment. During Charger Log VII in 1972, 300 tons of cargo were transferred from a LASH (Lighter Aboard Ship) ship to a Navy Fast Stores Ship (AFS). The only major problems with VERTREPPING from merchant ships are the lack of a deck staging and helo pick-up area and the need for the cargo to be palletized.

CONCLUSIONS

The unlikelihood of the Navy being allowed to build all the supply class AOE's it needs and the imminent decommissioning of the Nitro and Suribachi class of AOE's means that the Combat Logistics Force will be hard-pressed to provide the Operational Commander with the sustainability he needs in his Naval forces. Strategic sealift can be covered by MSC but underway replenishment of a widely dispersed battle group will probably require civilian augmentation of the CLF. In peacetime, the difficulties of finding available merchant ships revolve around labor union rules on wages/hours and competing commercial demands for shipping. In wartime, the availability of ships depends upon finding and/or outfitting the proper ships with compatible underway transfer equipment.

In terms of dollar cost, using merchant ships to augment the CLF is attractive and should be further explored. The Charger Log program should be continued and expanded. Unless the next war is with the Soviet Union, the sea lines of communication will be relatively free and the need to heavily escort the merchant underway replenishment groups will be minimal. In today's austere fiscal climate, the Navy must take the initiative in providing sustainability for the deployed battle group for the least dollar cost possible, and this means increasing the use of merchant ships for logistical support.

BIBLIOGRAPHY

Beamer, George P. Logistics in the maritime strategy: a potential war stopper? Newport, R.I. : NWC June 1986

Center for Naval Analysis. Institute of Naval Studies. Fleet replenishment system concepts study. Washington, July 1970

Hardgrave, Stephen W. Determining the feasibility of replenishing a dispersed carrier battle group. Monterey, Ca., NPGS, Sept 1969

Lindsay, William E. Mobile logistics support, organization and methods, today and tomorrow. Newport, R.I. NWC : Feb 1966

Center for Naval Analysis. Naval Planning, Manpower and Logistics Division. Merchant ship naval augmentation program. Alexandria, Va. : Dec 1985

Center for Naval Analysis. Institute of Naval Studies. The role of merchant ships in wartime defense missions. Arlington, Va. : Jan 1972

..... Substituting merchant ships for naval vessels: support missions. Alexandria, Va. : Jan 1979

..... The use of very large crude carriers for underway replenishment of POL. Alexandria, Va. : June 1979

Verrico, John S. "Getting it There Vital to Victory." Surface Warfare, May/Jun 1991, p. 6